IN THE U.S. PATENT AND TRADEMARK OFFICE

Application No.:   10/788,460

Filing Date: March 1, 2004

Appellants: Yigal BEJERANO et al.

Group Art Unit: 2617

Examiner: Marcos L. Torres

Title: METHODS AND DEVICES FOR PROVIDING A RELATIVE
                    LEVEL OF FAIRNESS AND QoS GUARANTEES TO
                    WIRELESS LOCAL AREA NETWORKS

Attorney Docket: 129250-000999/US

APPELLANTS' BRIEF ON APPEAL (Corrected)

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APPELLANTS' BRIEF ON APPEAL

I.   REAL PARTY IN INTEREST:

The real party in interest in this appeal is Lucent Technologies Inc. Assignment of the application was submitted to the U.S. Patent and Trademark Office and recorded at Reel 015033, Frame 0923.

II.   RELATED APPEALS AND INTERFERENCES:

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board's decision in this Appeal.

III.   STATUS OF CLAIMS:

Claims 1, 5-9, 13-18 and 22-25 are pending in the application, with **claims 1, 9 and 18** written in independent form. Claims 2-4, 10-12 and 19-21 are canceled.

Claims 1, 5-9, 13-18 and 22-25 remain finally rejected under 35 U.S.C. §103(a). Claims 1, 5-9, 13-18 and 22-25 are being appealed.

IV.   STATUS OF AMENDMENTS:

An Amendment After Final ("AAF") was filed on February 22, 2008. In an Advisory Action dated March 18, 2008, the Examiner stated that the Request was considered but did not place the application in condition for allowance.

V.   SUMMARY OF CLAIMED SUBJECT MATTER:

(i).   Overview of the Subject Matter of the Independent Claims

The present invention is directed at methods and devices that may be used to allocate so-called Contention Free Periods (CFPs) to wireless access points in wireless, Local area networks (WLANs). More specifically, independent claim 1 reads as follows (specification citations are in parenthesis):

1.   A method for providing a relative level of fairness and Quality of Service (QoS) in a wireless local area network (WLAN) network comprising:
identifying a set of non-interfering access points (paragraphs [0021] through [0023]);
dividing a Contention-Free period (CFP) into one or more slots (paragraphs [0017], [0032], [0042]and [0045]);
assigning one or more of the so divided slots to an identified access point based on the number of users associated with the access point (paragraph [0032]) **and to maximize a lower bound of a slot-to-user ratio** (paragraphs [0035] through [0039], [0042] and [0046] through [0048]);
allowing only the identified set of non-interfering access points to transmit during a so divided CFP slot (paragraphs [0016], [0017] and [0030]); **and**
allowing all access points to transmit after the end of the CFP (paragraph [0029]).

Independent claim 9 reads as follows:

9.   A system for providing a level of fairness and Quality of Service (QoS) in a WLAN comprising:
a controller operable to;
identify a set of non-interfering access points (paragraphs [0021] through [0023]);
divide a Contention-Free period (CFP) into one or more slots (paragraphs [0017], [0032], [0042] and [0045]);
assign one or more of the so divided slots to an identified access point based on the number of users associated with the access point (paragraph [0032]) **and to maximize a lower bound of a**

slot-to-user ratio(paragraphs [0035] through [0039], [0042] and [0046] through [0048]));

    allow only the identified set of non-interfering access points to transmit during a so divided CFP slot (paragraphs [0016], [0017] and [0030])**; and**

    allow all access points to transmit after the end of the CFP(paragraph [0029]).

Independent claim 18 reads as follows:

    18.   A system for providing a relative level of fairness and Quality of Service (QoS) in a wireless local area network (WLAN) network comprising:

    means for identifying a set of non-interfering access points (paragraphs [0021] through [0023]);

    means for dividing a Contention-Free period (CFP) into one or more slots(paragraphs [0017], [0032], [0042] and [0045]);

    means for assigning one or more of the so divided slots to an identified access point based on the number of users associated with the access point (paragraph [0032]) **and to maximize a lower bound of a slot-to-user ratio**(paragraphs [0035] through [0039], [0042] and [0046] through [0048]));

    means for allowing only the identified set of non-interfering access points to transmit during a so divided CFP slot (paragraphs [0016], [0017] and [0030])**; and**

    means for allowing all access points to transmit after the end of the CFP(paragraph [0029]).

In order to make the overview set forth above concise the disclosure that has been included, or referred to, above only represents a portion of the total disclosure set forth in the Specification that supports the independent claims.

(ii).   The Remainder of the Specification Also Supports the Claims

The Appellants note that there may be additional disclosure in the Specification that also supports the independent and dependent claims. Further, by including the specification citations in parenthesis above the Appellants do not represent that this is the only evidence that supports the

independent claims nor do Appellants necessarily represent that these citations alone can be used to fully interpret the claims of the present invention. Instead, the citations provide background support as an overview of the claimed subject matter.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

Appellants seek the Board's review and reversal of the rejection of claims 1, 5-9, 13-18 and 22-25 under 35 U.S.C. § 103(a) based on U.S. Patent Application Publication No. 2005/0169222 to Ayyagari ("Ayyagari") in view of U.S. Patent Application Publication No. 2006/0039281 to Benveniste ("Benveniste").

VII. ARGUMENTS:
A. The Section 103 Rejections

Claims 1, 5-9, 13-18 and 22-25 were rejected under 35 U.S.C. § 103(a) based on Ayyagari in view of Benveniste. Appellants respectfully disagree for at least the following reasons.

Claims 1, 9 and 18 (and through their dependencies, so too do the remaining claims) include the feature of assigning one or more of the so divided slots to an identified access point based on the number of users associated with the access point and to *maximize a lower bound of a slot-to-user ratio.*

In contrast neither Ayyagari nor Benveniste discloses or suggests this assignment feature. The Examiner refers the Appellants to paragraphs [0030], [0045]-[0049] and [0094]-[0101] of Ayyagari as allegedly disclosing an assignment feature that maximizes a lower bound of a slot-to-user ratio. However, neither these excerpts nor others in Ayyagari discloses such a feature.

For example, paragraph [0030] is completely silent with respect to a slot-to-user ratio, much less a lower bound of such a ratio that is maximized. Further, paragraphs [0045]-[0049] are directed at a "minimum duration" (i.e., time) not the lower bound of a slot-to-user ratio. Finally, paragraphs [0094]-[0101] discuss various messages used to request bandwidth; there appears to be no discussion of maximizing a lower bound of a slot-to-user ratio.

Conclusion:

Appellants respectfully request that members of the Board reverse the decision of the Examiner and allow claims 1, 5-9, 13-18 and 22-25.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 50-3777 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

Capitol Patent & Trademark Law Firm, PLLC

By: /John E. Curtin/

John E. Curtin, Reg. No. 37,602

P.O. Box 1995
Vienna, VA 22183
(703)266-3330

VIII. CLAIMS APPENDIX

1.   A method for providing a relative level of fairness and Quality of Service (QoS) in a wireless local area network (WLAN) network comprising:

identifying a set of non-interfering access points;

dividing a Contention-Free period (CFP) into one or more slots;

assigning one or more of the so divided slots to an identified access point based on the number of users associated with the access point and to maximize a lower bound of a slot-to-user ratio;

allowing only the identified set of non-interfering access points to transmit during a so divided CFP slot; and

allowing all access points to transmit after the end of the CFP.

2.   (Canceled).

3.   (Canceled).

4.   (Canceled)   .

5.   The method as in claim 1 further comprising:

assigning at least one so divided slot to each identified access point.

6.   The method as in claim 1 further comprising controlling each access point making up the identified set of non-interfering access points to ensure each access point begins and ends a transmission during the CFP slot.

7.   The method as in claim 1 further comprising:

transmitting an instruction to initiate transmission of one or more beacon messages to prevent users associated with access points from transmitting prior to the beginning of the CFP.

8.   The method as in claim 7 further comprising:

transmitting an instruction to initiate transmission of one or more beacon messages such that no two adjacent APs in an interference graph may send beacon messages simultaneously.

9.   A system for providing a level of fairness and Quality of Service (QoS) in a WLAN comprising:

a controller operable to;

identify a set of non-interfering access points;

divide a Contention-Free period (CFP) into one or more slots;

assign one or more of the so divided slots to an identified access point based on the number of users associated with the access point and to maximize a lower bound of a slot-to-user ratio;

allow only the identified set of non-interfering access points to transmit during a so divided CFP slot; and

allow all access points to transmit after the end of the CFP.

10.   (Canceled).

11.   (Canceled).

12.   (Canceled).

13. The system as in claim 9, wherein the controller is further operable to assign at least one so divided slot to each identified access point.

14. The system as in claim 9 wherein the controller is further operable to control each access point making up the identified set of non-interfering access points to ensure each access point begins and ends a transmission during the CFP slot.

15. The system as in claim 9, wherein the controller is further operable to transmit an instruction to initiate transmission of one or more beacon block messages to prevent users associated with access points from transmitting prior to the beginning of the CFP.

16. The system as in claim 15, wherein the controller is further operable to transmit an instruction to initiate transmission of one or more beacon messages such that no two adjacent APs in an interference graph may send beacon messages simultaneously.

17. The system as in claim 9 further comprising one or more sets of non-interfering access points, each set of access points operable to:
      transmit during at least one CFP slot; and
      transmit after the end of the CFP.

18. A system for providing a relative level of fairness and Quality of Service (QoS) in a wireless local area network (WLAN) network comprising:
      means for identifying a set of non-interfering access points;
      means for dividing a Contention-Free period (CFP) into one or more slots;

means for assigning one or more of the so divided slots to an identified access point based on the number of users associated with the access point and to maximize a lower bound of a slot-to-user ratio;

means for allowing only the identified set of non-interfering access points to transmit during a so divided CFP slot; and

means for allowing all access points to transmit after the end of the CFP.

19.   (Canceled).

20.   (Canceled).

21.   (Canceled).

22.   The system as in claim 18 further comprising:
means for assigning at least one so divided slot to each identified access point.

23.   The system as in claim 18 further comprising means for controlling each access point making up the identified set of non-interfering access points to ensure each access point begins and ends a transmission during the CFP slot.

24.   The system as in claim 18 further comprising:
means for transmitting an instruction to initiate transmission of one or more beacon messages to prevent users associated with access points from transmitting prior to the beginning of the CFP.

25.   The system as in claim 24 further comprising:

means for transmitting an instruction to initiate transmission of one or more beacon messages such that no two adjacent APs in an interference graph may send beacon messages simultaneously.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.